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Critical appraisal leaves our upper limb therapy intervention trial misrepresented

We have recently come across a critical appraisal and commentary[1,2] published in the *Journal of Physiotherapy* regarding our published trial[3] comparing action observation and repeated practice with repeated practice alone in children age 3 to 10 years with unilateral cerebral palsy. We were disappointed to find that our trial was misrepresented. The title of the synopsis should convey our message that home-based, parent-delivered therapy comprising action observation and repeated practice does not improve upper limb function more than repeated practice alone. Instead, the title of the synopsis implies that parent-delivered therapy does not lead to improved upper limb function in this group compared with repeated practice alone. It is not possible to make conclusions from our trial about the benefits of adding parent-delivered therapy to repeated practice alone, as in our trial both groups of children were receiving parent-delivered therapy. Furthermore, the synopsis title omits the word 'unilateral'; we studied a specific group of children with *unilateral* cerebral palsy, not cerebral palsy in general. The comment regarding difference in adherence between the two groups does not acknowledge the fact that the difference observed was not statistically significant. With reference to the comment that children with more severely affected hand function might not be able to perform the prescribed tasks, we tailored activities to the interests and abilities of participants.

In contrast to the suggestion from the published synopsis title, we found that both parent-delivered home-based approaches that were used led to small but significant improvements in hand function in children aged 3 to 10 years with unilateral cerebral palsy. These improvements were seen in all of the three outcome measures that were used. The very reason for embarking on this trial was our awareness of a need to supplement therapist input with parent-delivered home-based approaches in an attempt to increase the overall therapy dose. We were successful in achieving this. Therefore, in addition to our open access published paper we have produced a lay summary http://www.scope.org.uk/Support/Professional/Medical/Play, which clearly states the trial findings, and a website https://research.ncl.ac.uk/hemiplegiaresearch- fungames/ providing free access to materials for parents to use and therapists to suggest as supplementary to formal therapy sessions.

We applaud the provision of open access summaries of research findings in the *Journal of Physiotherapy*. On this occasion, key aspects of the research have been misrepresented in the critical appraisal and we request that this is addressed.

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Anna Purna Basu[a,b], Emma Victoria Kirkpatrick[c] and Janice Pearse[d]

[a]*Institute of Neuroscience, Newcastle University, Newcastle upon Tyne*
[b]*Department of Paediatric Neurology, Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle*
[c]*Clinical Trials Unit, Southampton University, Southampton*
[d]*Therapy Services, Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK*

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Reply to Basu et al

We are happy to respond to the comments made in the above letter about the *Journal of Physiotherapy*'s appraisal[1] of the trial by Kirkpatrick et al.[2]

The approach taken in the Critically Appraised Papers section of the *Journal of Physiotherapy* for reporting results of randomised, controlled trials is to focus on between-group differences. As stated by the eminent statisticians, Bland and Altman:

> *The essential feature of a randomised trial is the comparison between groups. Within group analyses do not address a meaningful question: the question is not whether there is a change from baseline, but whether any change is greater in one group than the other.*[3]

We stand by this approach. This makes it impossible to agree with the authors' claim that both 'parent-delivered home-based approaches used led to small but significant improvements in hand function in children aged 3 to 10 years with unilateral cerebral palsy'.

A misconception that underlies the authors' comments is that the within-group improvements observed in both groups in the trial should be interpreted as evidence that both interventions are effective. In point of fact, analyses of within-group data against baseline, although often used, can be highly misleading.[4] Interpreting data in this way may be invalid because any improvement could be due to something other than the interventions, such as becoming more familiar with the test procedures. The only way to determine whether any improvement was due to the interventions is by using a third 'no intervention' group for comparison, which this trial did not have.

The letter also indicates that the title of the synopsis was misleading and lacked important details. Because of the amount of